

Grade 3 Math Scoring Guidance

2015-2016 NYC End-of-Year Performance Tasks

Instructions

- The following pages contain guidance on the scoring of the above-named NYC Performance Task.
- Distribute this guide to all staff scoring the task. *Please note: End-of-Year tasks may be administered by the regular classroom teacher but **may not be scored** by the regular classroom teacher.*
- The scoring guidance is intended to be used in conjunction with the rubric, which details indicators of performance levels on all rubric traits.

Overview of the NYC Performance Tasks

The NYC Performance Tasks are comparable baseline and End-of-Year, open-ended assessment pairs that are offered in math, ELA, science, and social studies and promote the instructional shifts of argument and critique, use and analysis of evidence, and exposure to complex texts. The tasks are designed for students to demonstrate their skills in reviewing and analyzing presented evidence and creating an evidence-based argument.

The tasks respond to and support the diversity of curriculum and instruction that exist across NYC schools and act as a resource in these varied settings to support collaborative discourse around curriculum, instruction, and assessment. Tasks are designed to support the Citywide Instructional Expectations by promoting knowledge of students, facilitating alignment to an instructional focus, and developing a culture of collaborative professional learning.

A skills-based, standards-driven rubric accompanies each task and, where feasible, is content agnostic so that it can be used in a variety of ways with other curricular and instructional materials. Rubrics are aligned to the Common Core standards and content-specific New York State standards where appropriate. Topic selection in each grade and subject was influenced by New York City scope and sequence documents.

The following scoring guide structure was adapted from CPET and provides annotated student work samples that show the relationship between the student response and the criteria in the rubric. A matrix of rubric scores and rationales follows each individual student work sample. The guide can also be used to norm scoring practices across teams of educators.

Design Principles for the Math Performance Tasks

Focus Standards

While there may be multiple Common Core standard alignments (partial or full) for each trait in the rubric, the focus standards are used to inform design consistency across grades. In math, the Practices are used as the unifying design principle across grades in lieu of content standards. Grade-level content standard alignment is represented on each rubric.

- MP1: Make sense of problems and persevere in solving them
- MP4: Model with mathematics

See the last page of this guide for a chart of standards alignment per rubric trait across all grade levels.

Design Concept

The design concept for math addresses the following in each grade band:

Grades K-1

- Inventory

Grades 2-12

- Presentation of context
- Multiple mini-task questions addressing that one context

Content and Structure

The topic (e.g., "plants") in each task is used to provide context for students to demonstrate mastery of the focus standards and content standards in math. The design of the task is not for students to demonstrate content knowledge on any particular topic. The content standards chosen represent the major work of the grade, and are structured to measure both discrete and complex skill mastery. Unlike other subject area rubrics, rubric traits in math measure the total allowable score points per question; therefore, not every trait on the rubric has descriptors through four points.

Grade 3 Math Scoring Guidance

Task Overview

NYC Mathematics Performance Tasks are mathematics tasks in which students are presented with a series of connected questions. Each question on the task is intended to address understanding and proficiency of mathematical content, as well as engagement with mathematical practices.

Student Task

Students produce **a numerical** and/or written response. Sample student responses have been provided to you; further information regarding these annotated student works are provided below.

Evaluator Task

You are being asked to use your best, professional judgment to score these student responses using the rubric provided.

General Instructions for Using the Rubric

- (1) Scorers will use the separate rubric provided to assess student performance.
- (2) These traits are being scored for content and practice. Point values may vary from question to question, and there is no eligible point value for areas on the rubric that are blank.
- (3) You are to provide one score for each rubric trait. Please be sure to enter all trait scores on the appropriate Schoolnet Answer Sheet for each student. The final score for the task will be calculated elsewhere.
- (4) All student work in the task booklet should be scored, regardless of whether the student completed or attempted every question.
- (5) A score of “Zero (0) – No attempt” should be considered carefully before being used. See included student work samples for guidance. Scores of “Zero (0) – No attempt” should only be given if:
 - (a) a student did not attempt that question on **any portion** of the task, or
 - (b) if his/her work is **completely copied** directly from the task or texts, or
 - (c) if his/her work is completely unrelated to the question or prompt.

Annotated Student Work

The following pages include annotated student work samples at a variety of performance levels. The samples have been annotated to highlight student responses in relation to the rubric traits. Each sample is followed by a summary page indicating the sample’s score on each rubric trait, in addition to the reasoning for the score. Please review these samples both independently and **with a team** to ensure a common understanding of the rubric traits at all performance levels.

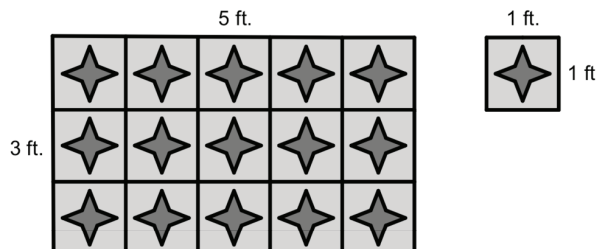
Best Practices for Scoring

- Before scoring a specific task, teacher **teams** should review the task and the rubric and discuss expected performance at each level for each rubric trait.
- As a group, review annotated student work and **discuss evidence for each score**, including discussing non-blank, zero-scored traits. Work to understand the provided scores and rationales for one sample.
- Individually score a few provided student work samples. After working individually, **compare your assigned scores** to those given by others and to the provided scores and rationales. Be sure you understand how each score was assigned, and that your team agrees, before moving to independent work.
- After independently completing a set of student work from your school, review the set with the group to see if you have drifted away from your original scoring, becoming either more severe or more lenient in response to the task. Consistent scoring is important.

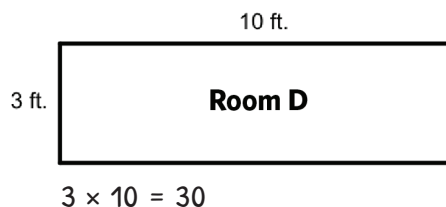
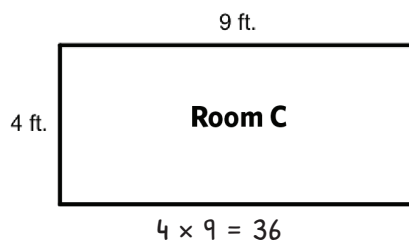
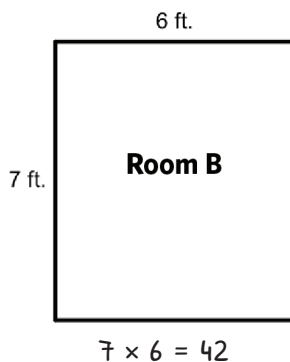
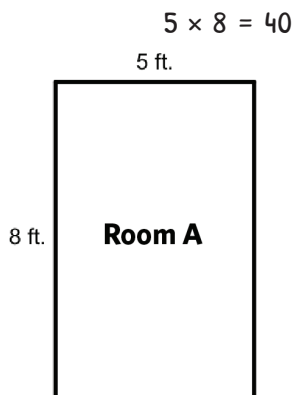


Tilly's Tiles

Tilly uses tiles that are 1 square foot to cover floors. Tilly is working on Mrs. Diaz's house tiling floors in many of the rooms. For example, the floor to the right is 5 feet long and 3 feet wide and is made of 15 tiles. Tilly needs to decide how many tiles she will need for each floor.

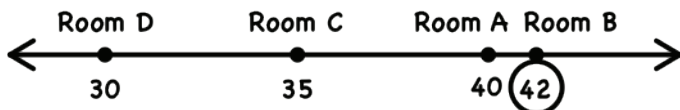


- 1 In Mrs. Diaz's house there will be 4 rooms for Tilly to tile:



Which room has the largest area? Room B

Show your work.



T1

The response shows an understanding of finding the area of rectangles in the context of real-world problems by multiplying side lengths. The response also shows understanding of ordering numbers, using a number line as a model.



- 2 Tilly will also tile the two bathroom floors in Mrs. Diaz's house. Both bathroom floors are rectangular floors that are each 4 feet wide.

Tilly uses a total of 40 tiles to cover both bathroom floors. What could be the lengths and widths of each floor if Tilly uses a total of exactly 40 tiles?

Measurements of Floor 1 - Length: 4 feet Width: 5 feet

Measurements of Floor 2 - Length: 5 feet Width: 4 feet

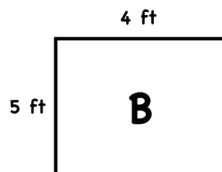
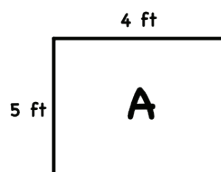
Show your work.

$$4 \times 10 = 40$$

$$A = 4 \times 5 = 20$$

$$B = 5 \times 4 = 20$$

$$\text{Both} = 20 + 20 = 40$$



T2

The response demonstrates an understanding of division as an unknown factor in solving for the area of both floors. The response also shows an understanding of area as being additive, since an area of 40 is decomposed into an area of 4 ft. \times 5 ft. and 5 ft. \times 4 ft. The response shows an overall conceptual understanding of the trait by showing that the areas of Floor 1 and Floor 2 produce a total area of 40.

- 3 Tilly uses 72 tiles for Mrs. Diaz's outdoor patio. There are 8 tiles in each row of the patio.

How many rows are there? 9 rows

Write and solve a multiplication sentence to model the problem.

$$8 \times \square = 72$$

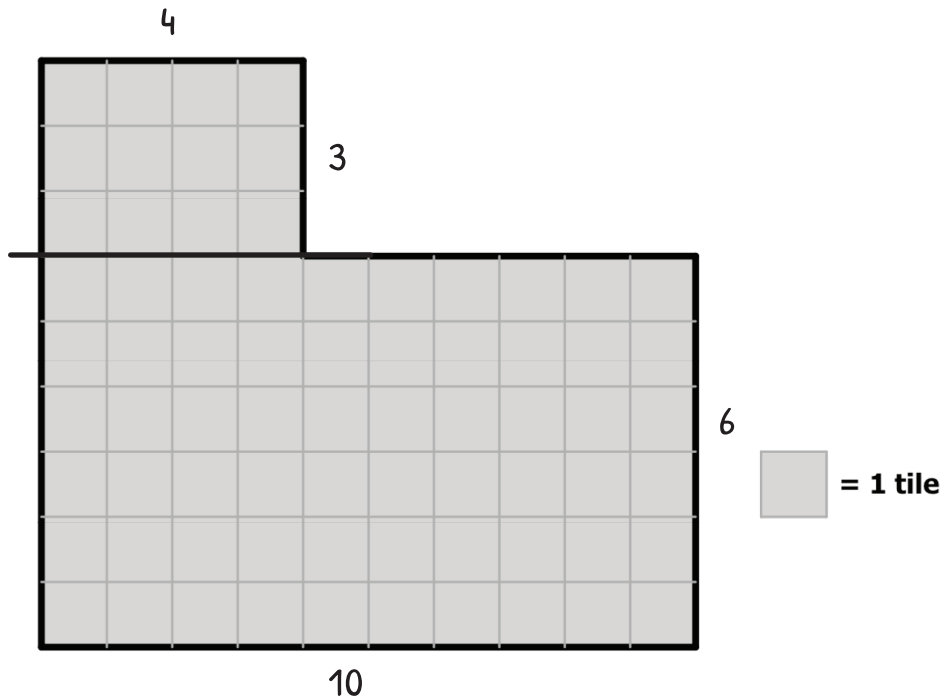
$$72 \div 8 = 9$$

T3

The response shows understanding of division as an unknown-factor problem, finding 9 groups of 8 in 72.



- 4 Mrs. Diaz's kitchen is not a rectangle. Tilly needs to cover the floor shown below with tiles.



How many tiles will Tilly need to make the kitchen floor? 72 tiles

Show your work using number sentences.

$$4 \times 3 = 12$$

$$12 + 60 = 72$$

$$6 \times 10 = 60$$

T4

The response shows an understanding that area is additive by finding the area of rectilinear figures by decomposing them into non-overlapping rectangles, in this case 3×4 and 6×10 .



- 5 Mrs. Diaz’s neighbors would like Tilly to tile their kitchens. There are 4 kitchen floors to tile and each kitchen will use 90 tiles.

How many total tiles will Tilly need for the 4 kitchen floors? 360 tiles

Show your work.

$$9 \times 4 = 36$$

$$(9 \times 4) \times 10 = 360$$

T5

The response shows understanding of multiplying a one-digit number by a multiple of 10, using strategies based on place value and properties of operations such as the associative and commutative properties—knowing that $9 \times 4 = 36$ and $4 \times 90 = 4 \times (9 \times 10) = (4 \times 9) \times 10$.

- 6 Tilly was asked to work on another project where a new neighborhood is being built. In the first plan, there were going to be 6 houses on each street and 6 streets total. The plans have changed and now there are 4 streets, but there is still the same total number of houses being built in the new neighborhood.

How many houses are now on each street? 9 houses

Show your work.

$$6 \times 6 = 36$$

$$\begin{array}{r} \div 4 \\ \hline 9 \end{array}$$

T6

The response shows understanding of solving two-step word problems in situations involving equal groups using multiplication and division. First, 6 is multiplied by 6 to find the total number of houses, then 36 is divided by 4 to find the number of houses on each street. This shows an understanding of the factors of 36 as they apply to the context of the trait.



- 7 For another job Tilly will need 80 special tiles. She makes 6 special tiles each week.**

After 8 weeks of making special tiles, how many more tiles does Tilly still need to make to have 80 special tiles? 32 **more tiles**

Use estimation to show why your answer is reasonable.

$$6 \times 8 = 48$$

$$80 - 48 = 32$$

T7

The response shows understanding of solving two-step word problems using the four operations, representing the problem with equations, and assessing the reasonableness of the answer using estimation strategies such as rounding. It is reasonable to infer that there is an understanding of benchmark fractions demonstrated by the comparison of 32 to 40.

I know my answer is reasonable because if she made 5 tiles each week, she'd be halfway done ($5 \times 8 = 40$). Since she makes a little more than 5 a week, she is a little more than halfway done (48 done, 32 to go).

Sample A - Anchor Paper Commentary

Subject/Course: Math

Task Title: Tilly's Tiles

Grade Level: 3

Year: 2015-2016

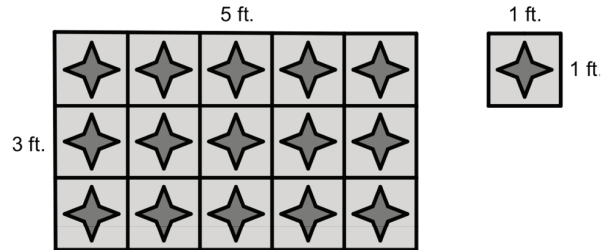
Rubric Traits	Anchor Score	Commentary/Rationale	Maximum Score
T1 Trait 1	2	The correct answer of Room B is given, and a correct process is shown, given by the equations for the area of each room.	2
T2 Trait 2	2	A correct answer of 4 ft. \times 5 ft. and 5 ft. \times 4 ft. is given. A correct process is shown to indicate that 40 tiles are used altogether.	2
T3 Trait 3	2	A correct answer of 9 rows is given, and a correct multiplication sentence is written: $8 \times \underline{\quad} = 72$.	2
T4 Trait 4	2	A correct answer of 72 tiles is given. A correct process is shown, decomposing the area into two rectangles of $4 \times 3 = 12$ and $6 \times 10 = 60$, which leads to $12 + 60 = 72$.	2
T5 Trait 5	2	A correct answer of 360 tiles is given. A correct process is shown by $9 \times 4 = 36$ and $(9 \times 4) \times 10 = 360$.	2
T6 Trait 6	2	A correct answer of 9 houses is given. A correct process is shown by $6 \times 6 = 36$, and then dividing 36 by 4.	2
T7 Trait 7	2	A correct answer of 32 more tiles is given. A correct application of estimation is used to show the reasonableness of the answer.	2

Score = 14/14, Level 4: Exceeding Standards

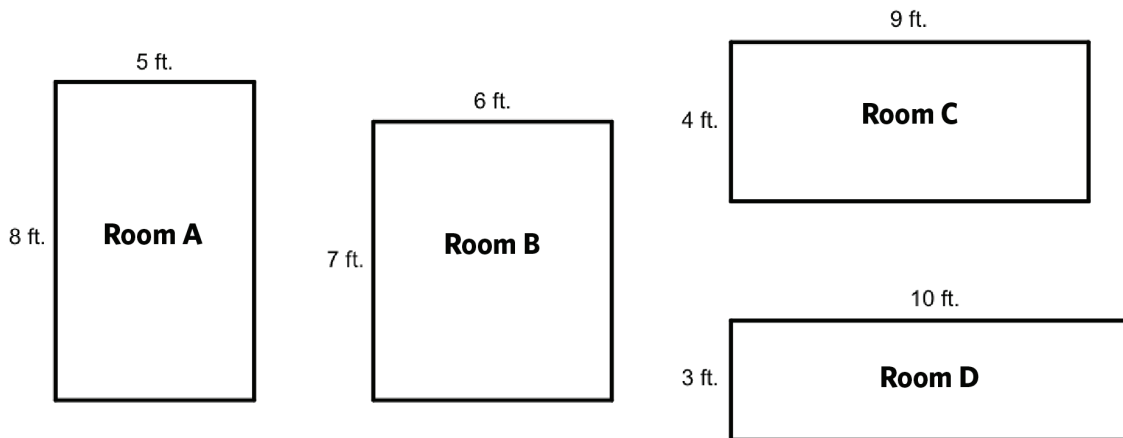


Tilly's Tiles

Tilly uses tiles that are 1 square foot to cover floors. Tilly is working on Mrs. Diaz's house tiling floors in many of the rooms. For example, the floor to the right is 5 feet long and 3 feet wide and is made of 15 tiles. Tilly needs to decide how many tiles she will need for each floor.



1 In Mrs. Diaz's house there will be 4 rooms for Tilly to tile:



Which room has the largest area? Room B

Show your work.

Room A

$$5 \times 8 =$$

$$5 + 5 + 5 + 5 +$$

$$5 + 5 + 5 + 5 = 40$$

Room C

$$9 \times 3 =$$

$$9 + 9 + 9 = 25$$

Room B

$$6 \times 7 =$$

$$7 + 7 + 7 + 7 + 7 + 7 + 7 = 45$$

Room D

$$3 \times 10 = 30$$

$$10 + 10 + 10 = 30$$



The response shows some understanding of finding the area of rectangles in the context of real-world problems by multiplying side lengths. The response demonstrates repeated addition in order to find the products for the area of each room. It is reasonable to infer that the response shows a lack of fluency with regard to multiplication facts.



- 2 Tilly will also tile the two bathroom floors in Mrs. Diaz's house. Both bathroom floors are rectangular floors that are each 4 feet wide.

Tilly uses a total of 40 tiles to cover both bathroom floors. What could be the lengths and widths of each floor if Tilly uses a total of exactly 40 tiles?

Measurements of Floor 1 - Length: 4 feet Width: 6 feet

Measurements of Floor 2 - Length: 4 feet Width: 4 feet

T2

The response shows an understanding of division as an unknown factor within the context of the trait. The response shows understanding of area as an additive, adding non-overlapping rectangles in order to show that the total area of both floors will be 40 tiles.

Show your work.

$$4 \times 6 = 24$$

$$4 \times 4 = \underline{16}$$
$$40$$

- 3 Tilly uses 72 tiles for Mrs. Diaz's outdoor patio. There are 8 tiles in each row of the patio.

How many rows are there? 9 rows

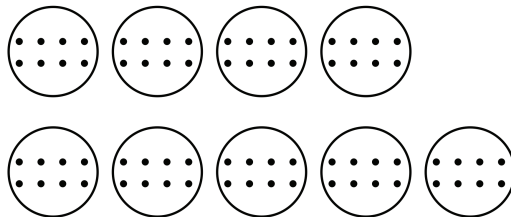
T3

The response shows understanding of division as an unknown-factor problem, finding the number of groups of 8 in 72. A drawing is used to model 9 groups of 8.

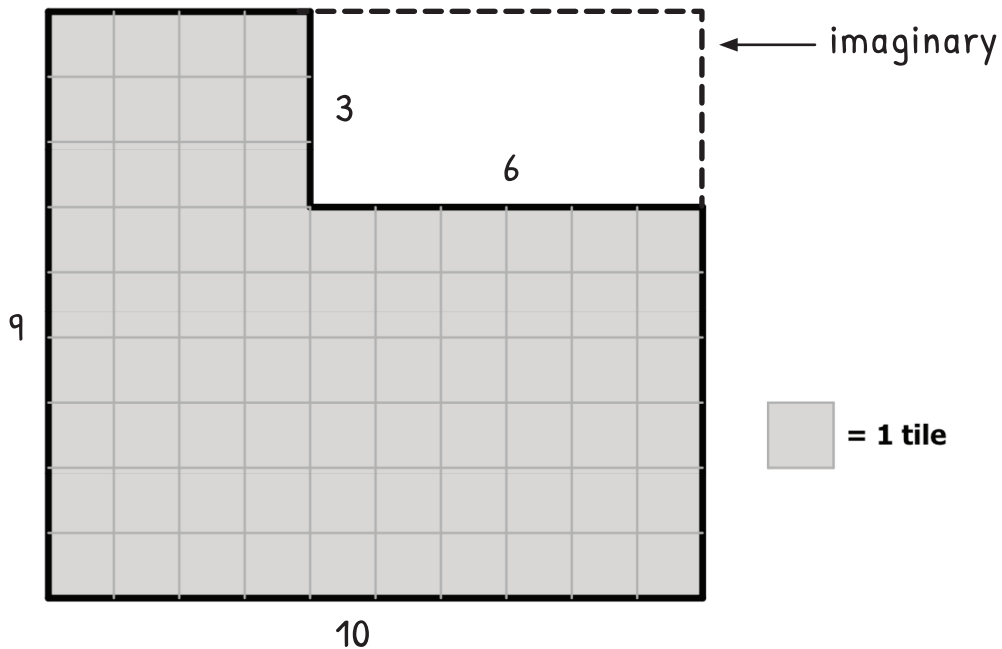
Write and solve a multiplication sentence to model the problem.

$$8 \times 9 = 72$$

$$72 \div 8 = 9$$



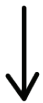
- 4 Mrs. Diaz's kitchen is not a rectangle. Tilly needs to cover the floor shown below with tiles.



How many tiles will Tilly need to make the kitchen floor? 72 tiles

Show your work using number sentences.

$$9 \times 10 - 3 \times 6 \leftarrow \text{imaginary tiles}$$



$$90 - 18 = 72 \leftarrow \text{actual tiles}$$

T4

The response shows an understanding of using the area of rectangles to solve a real-world problem. The response also shows an understanding that area is additive by finding the area of rectilinear figures by finding the area of the rectangle that contains the figure (9×10) and subtracting the area of the missing rectangular area (3×6).



- 5 Mrs. Diaz’s neighbors would like Tilly to tile their kitchens. There are 4 kitchen floors to tile and each kitchen will use 90 tiles.

How many total tiles will Tilly need for the 4 kitchen floors? 720 tiles

Show your work.

$$\begin{array}{r} 90 \\ \swarrow \searrow \\ 9 \times 10 \end{array}$$

$$9 \times 4 = 36$$

$$36 \times 10 = 360$$

$$\begin{array}{r} 360 \\ + \\ \hline 720 \end{array}$$

T5

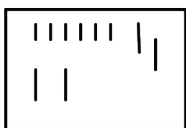
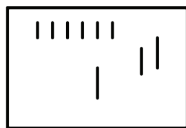
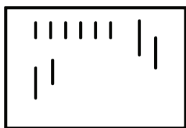
The response shows understanding of multiplying a one-digit number by a multiple of 10, using strategies based on place value and properties of operations such as the associative and commutative properties—knowing that $9 \times 4 = 36$ and $4 \times 90 = 4 \times (9 \times 10) = (4 \times 9) \times 10 = 36 \times 10 = 360$. It is unclear from the response why the total number of tiles was doubled. It is reasonable to infer that there was a misinterpretation of the problem context.

- 6 Tilly was asked to work on another project where a new neighborhood is being built. In the first plan, there were going to be 6 houses on each street and 6 streets total. The plans have changed and now there are 4 streets, but there is still the same total number of houses being built in the new neighborhood.

How many houses are now on each street? 10 houses

Show your work.

$$6 \times 6 = 36$$



T6

The response shows understanding of solving two-step word problems in situations involving equal groups using multiplication and division. First, 6 is multiplied by 6 to find the total number of houses, then 36 is divided by 4 to find the number of houses on each street by using a diagram. Six tallies are made initially, starting with 6 houses per street. Tallies are added with 3 of 4 “streets,” showing 10 tallies.

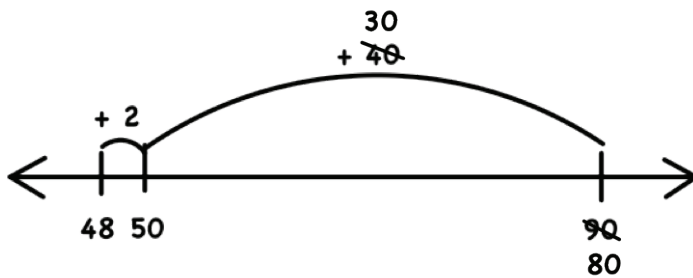


- 7 For another job Tilly will need 80 special tiles. She makes 6 special tiles each week.

After 8 weeks of making special tiles, how many more tiles does Tilly still need to make to have 80 special tiles? 32 more tiles

Use estimation to show why your answer is reasonable.

$$6 \times 8 = 48$$



T7

The response shows understanding of solving two-step word problems using the four operations, representing the problem with an equation (6×8) and a drawing to show the subtraction. The response does not explicitly show understanding of assessing the reasonableness of the answer using estimation.

Sample B - Anchor Paper Commentary

Subject/Course: Math

Task Title: Tilly's Tiles

Grade Level: 3

Year: 2015-2016

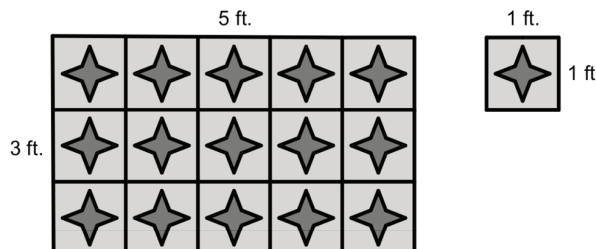
Rubric Traits	Anchor Score	Commentary/Rationale	Maximum Score
T1 Trait 1	1	The correct answer of Room B is given. However, it is based on an incorrect process given by incorrect computations for the area of Room B and the area of Room C, given by $9 \times 3 = 25$ and $6 \times 7 = 45$.	2
T2 Trait 2	2	A correct answer of 4 ft. \times 6 ft. and 4 ft. \times 4 ft. is given. A correct process is shown to indicate that 40 tiles are used altogether, given by $4 \times 6 = 24$ and $4 \times 4 = 16$, which leads to $24 + 16 = 40$.	2
T3 Trait 3	2	A correct answer of 9 rows is given. A correct process is given by $8 \times 9 = 72$ and $72 \div 8 = 9$.	2
T4 Trait 4	2	A correct answer of 72 tiles is given. A correct process is shown, finding the area of the rectangle that contains the figure, 9×10 , and subtracting the area of the missing rectangle, 3×6 . This leads to $9 \times 10 - 3 \times 6$, which gives $90 - 18 = 72$.	2
T5 Trait 5	1	An incorrect answer of 720 tiles is given. A correct process is shown, but an additional computation of adding 360 again leads to an incorrect answer.	2
T6 Trait 6	1	An incorrect answer of 10 houses is given. A correct process is shown, finding 36 total houses and then dividing this into 4 groups using tallies. A computational error in recording the tallies leads to an incorrect answer.	2
T7 Trait 7	1	A correct answer of 32 more tiles is given. A number-line model is used to show $80 - 48 = 32$. Estimation is not used to show the reasonableness of the answer.	2

Score = 10/14, Level 3: Meeting Standards

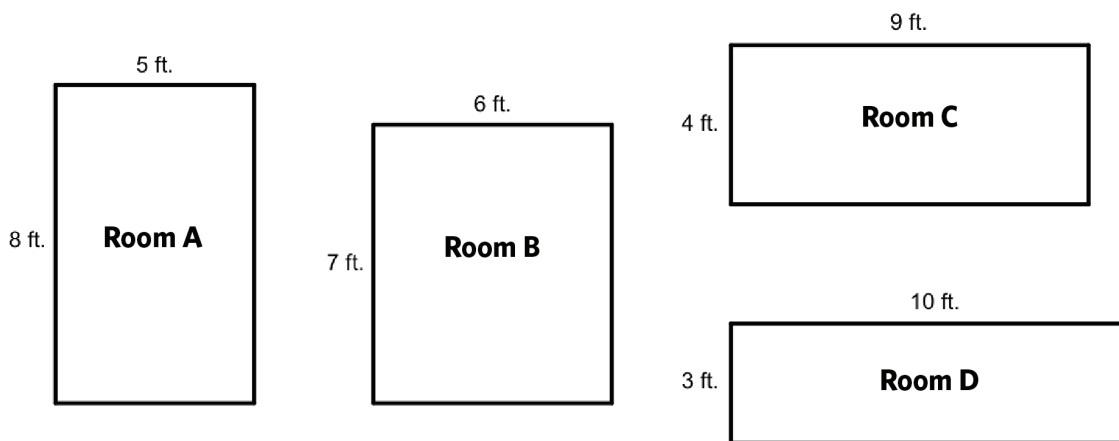


Tilly's Tiles

Tilly uses tiles that are 1 square foot to cover floors. Tilly is working on Mrs. Diaz's house tiling floors in many of the rooms. For example, the floor to the right is 5 feet long and 3 feet wide and is made of 15 tiles. Tilly needs to decide how many tiles she will need for each floor.



1 In Mrs. Diaz's house there will be 4 rooms for Tilly to tile:



Which room has the largest area? Room A

Show your work.

$$5 \times 8 = 40$$

$$6 \times 7 = 42$$

$$4 \times 9 = 36$$

$$3 \times 10 = 30$$

T1

The response shows an understanding of finding the area of rectangles in the context of real-world problems by multiplying side lengths. Although the multiplication is done correctly, an incorrect answer is given. This could simply be an error or a misconception regarding which number is largest.



- 2 Tilly will also tile the two bathroom floors in Mrs. Diaz's house. Both bathroom floors are rectangular floors that are each 4 feet wide.

Tilly uses a total of 40 tiles to cover both bathroom floors. What could be the lengths and widths of each floor if Tilly uses a total of exactly 40 tiles?

Measurements of Floor 1 - Length: 4 feet Width: 4 feet

Measurements of Floor 2 - Length: 4 feet Width: 8 feet

Show your work.

$$4 \times 4 = 16$$

$$4 \times 8 = 24$$

$$16 + 24 = 40$$

T2

The response shows a correct process for finding the measurements of Floor 1 and Floor 2, using division to find an unknown factor. The work shows $16 + 24 = 40$, and both are multiples of 4: four 4s + eight 4s makes twelve 4s (48). The work shows an incorrect recall of fact, shown by $4 \times 8 = 24$. There is an overall understanding of the problem context demonstrated in the response.

- 3 Tilly uses 72 tiles for Mrs. Diaz's outdoor patio. There are 8 tiles in each row of the patio.

How many rows are there? 9 rows

Write and solve a multiplication sentence to model the problem.

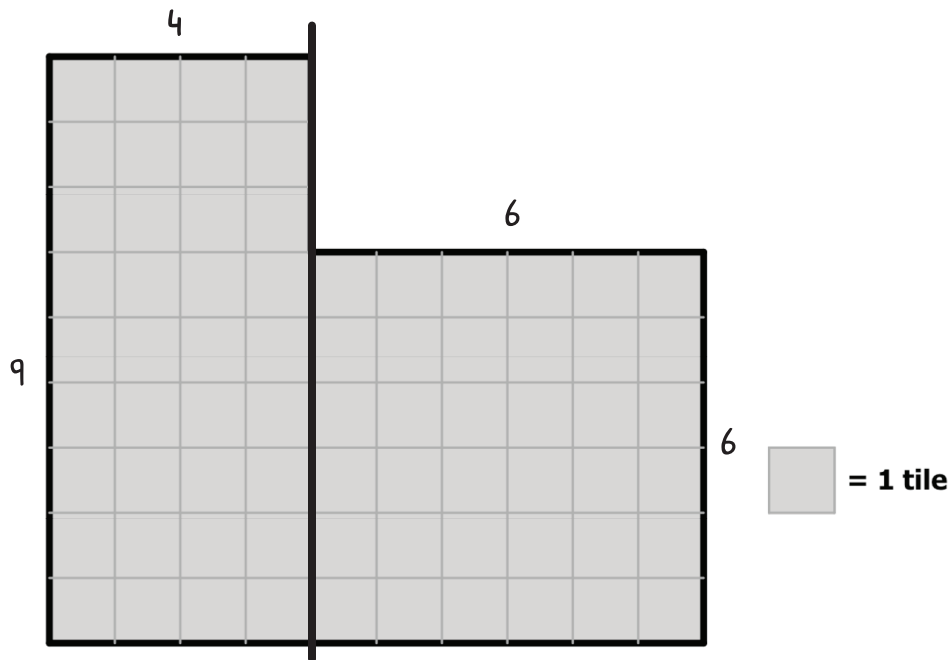
$$72 \div 8 = 9$$

T3

The response shows a correct process for finding the number of rows using a division sentence. It is reasonable to infer that the response shows a misconception with regard to the process of using a multiplication sentence to model the problem.



- 4 Mrs. Diaz's kitchen is not a rectangle. Tilly needs to cover the floor shown below with tiles.



How many tiles will Tilly need to make the kitchen floor? 71 tiles

Show your work using number sentences.

$$4 \times 9 = 35$$

$$6 \times 6 = 36$$

$$35 + 36 = 71$$

T4

The response shows a correct process for finding the area of the kitchen floor using number sentences. The response demonstrates an understanding that area is additive by finding the area of rectilinear figures by decomposing them into non-overlapping rectangles, in this case 4×9 and 6×6 . A computational error, $4 \times 9 = 35$, leads to an incorrect answer.



- 5 Mrs. Diaz's neighbors would like Tilly to tile their kitchens. There are 4 kitchen floors to tile and each kitchen will use 90 tiles.

How many total tiles will Tilly need for the 4 kitchen floors? 360 tiles

Show your work.

$$\begin{array}{c} 90 \\ \swarrow \downarrow \searrow \\ 30 \ 30 \ 30 \end{array}$$

$$4 \times 30 = 120$$

$$4 \times 30 = 120$$

$$4 \times 30 = 120$$

$$120 + 120 = 240$$

$$240 + 120 = 360$$

T5

The response shows a correct process for finding the product of 90 and 4 by using multiples of 10, decomposing 90 tiles into equal quantities of 30 tiles which are multiplied by 4. The response demonstrates an understanding that area is additive as well as an understanding of how to use the area of rectangles to solve real-world problems.

- 6 Tilly was asked to work on another project where a new neighborhood is being built. In the first plan, there were going to be 6 houses on each street and 6 streets total. The plans have changed and now there are 4 streets, but there is still the same total number of houses being built in the new neighborhood.

How many houses are now on each street? 8 houses

Show your work.

$$6 \times 6 = 36$$

$$36 \div 4 = 8$$

T6

The response demonstrates a correct process for finding the number of houses using multiplication and division to solve a word problem involving measurement quantities. It is clear from the response that there is an understanding that the area of the neighborhood will be the same after, but the number of streets and houses per street will be different. A computational error, $36 \div 4 = 8$, leads to an incorrect answer.



- 7 For another job Tilly will need 80 special tiles. She makes 6 special tiles each week.**

After 8 weeks of making special tiles, how many more tiles does Tilly still need to make to have 80 special tiles? 32 **more tiles**

Use estimation to show why your answer is reasonable.

$$6 \times 8 = 48, \quad 32 + 48 = 80$$

48 is almost 50, and $80 - 50 = 30$, so she has about 30 left (she has 32).

T7

The response shows a correct process for solving a two-step word problem using multiplication, addition, and subtraction equations and assessing the reasonableness of the answer by rounding 48 and 32 to the nearest ten for the purpose of comparison.

Sample C - Anchor Paper Commentary

Subject/Course: Math

Task Title: Tilly's Tiles

Grade Level: 3

Year: 2015-2016

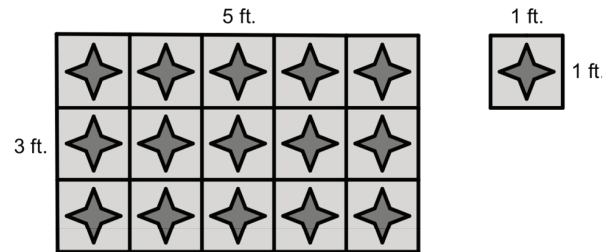
Rubric Traits	Anchor Score	Commentary/Rationale	Maximum Score
T1 Trait 1	1	An incorrect answer of Room A is given. A correct process is shown, with the areas of all four rooms given correctly.	2
T2 Trait 2	1	An incorrect answer of 4 ft. \times 4 ft. and 4 ft. \times 8 ft. is given. A correct process is shown to indicate that 40 tiles are used altogether, but a computational error, $4 \times 8 = 24$, leads to an incorrect answer.	2
T3 Trait 3	1	A correct answer of 9 rows is given. An equation is given by $72 \div 8 = 9$ rather than a multiplication equation.	2
T4 Trait 4	1	An incorrect answer of 71 tiles is given. A correct process is shown, with a computational error given by $4 \times 9 = 35$, which leads to an incorrect answer.	2
T5 Trait 5	2	A correct answer of 360 tiles is given. A correct process is shown, given by $4 \times 30 = 120$; $120 + 120 = 240$; and $240 + 120 = 360$.	2
T6 Trait 6	1	An incorrect answer of 8 houses is given. A correct process is given by the equation $6 \times 6 = 36$. A computational error, $36 \div 4 = 8$, leads to an incorrect answer.	2
T7 Trait 7	2	A correct answer of 32 more tiles is given, and estimation is used to show the reasonableness of the answer, rounding 48 to 50 and 32 to 30 and then comparing $32 + 48 = 80$ to $80 - 50 = 30$.	2

Score = 9/14, Level 3: Meeting Standards

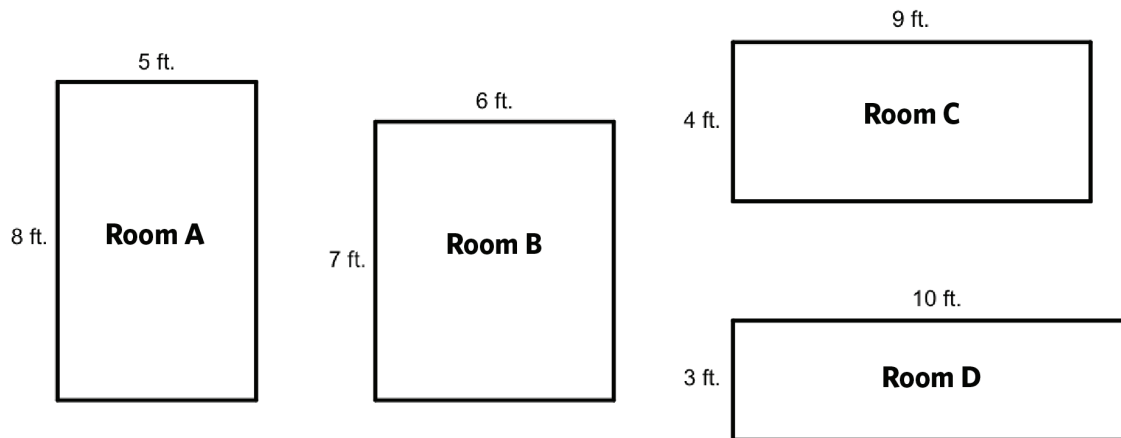


Tilly's Tiles

Tilly uses tiles that are 1 square foot to cover floors. Tilly is working on Mrs. Diaz's house tiling floors in many of the rooms. For example, the floor to the right is 5 feet long and 3 feet wide and is made of 15 tiles. Tilly needs to decide how many tiles she will need for each floor.



1 In Mrs. Diaz's house there will be 4 rooms for Tilly to tile:



Which room has the largest area? They are all the same size

Show your work.

A

$$\begin{array}{r} 8 + 8 = 16 \\ 5 + 5 = 10 \\ \hline 26 \end{array}$$

B

$$\begin{array}{r} 7 + 7 = 14 \\ 6 + 6 = 12 \\ \hline 26 \end{array}$$

C

$$\begin{array}{r} 9 + 9 = 18 \\ 4 + 4 = 8 \\ \hline 26 \end{array}$$

D

$$\begin{array}{r} 3 + 3 = 6 \\ 10 + 10 = 20 \\ \hline 26 \end{array}$$

T1

The response shows an incorrect process for finding the room with the largest area by multiplying side lengths to find the area of rectangles. The response indicates a misconception regarding area since the perimeter of each rectangle is found.



- 2 Tilly will also tile the two bathroom floors in Mrs. Diaz's house. Both bathroom floors are rectangular floors that are each 4 feet wide.

Tilly uses a total of 40 tiles to cover both bathroom floors. What could be the lengths and widths of each floor if Tilly uses a total of exactly 40 tiles?

Measurements of Floor 1 - Length: 2 feet Width: 10 feet

Measurements of Floor 2 - Length: 2 feet Width: 10 feet

T2

The response shows an incorrect process for using division to find the length of the rectangles represented by Floor 1 and Floor 2. It is reasonable to infer that the strategy shown in the response does not account for a width of 4 feet for each rectangle, since the number of bathrooms is used as the length. The response demonstrates some understanding of the context of the problem.

Show your work.

$$40 \div 2 = 20$$

$$2 \times 10 = 20$$

$$2 \times 10 = 20$$

40 tiles

- 3 Tilly uses 72 tiles for Mrs. Diaz's outdoor patio. There are 8 tiles in each row of the patio.

How many rows are there? 576 rows

T3

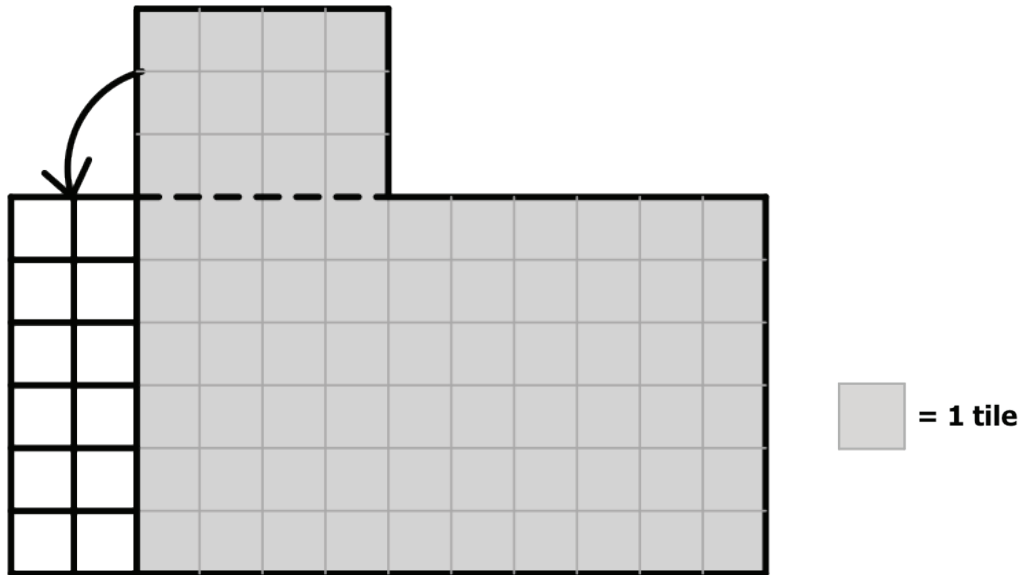
The response does not show understanding of division as an unknown-factor problem, as the problem has been misinterpreted as 72 rows of 8 tiles each. The response may indicate a misconception with regard to the use of a multiplication sentence to model the problem and a misconception regarding the problem context.

Write and solve a multiplication sentence to model the problem.

$$\begin{array}{r} 72 \\ \times 8 \\ \hline 576 \end{array}$$



- 4 Mrs. Diaz's kitchen is not a rectangle. Tilly needs to cover the floor shown below with tiles.



How many tiles will Tilly need to make the kitchen floor? 72 tiles

Show your work using number sentences.

I moved the 12 tiles on top to the side to make a rectangle 6×12 .

$$6 \times 12 = 72$$

T4

The response demonstrates a correct process for finding the area of the kitchen floor using the areas of two rectangles. The response shows an understanding that area is additive by finding the area of rectilinear figures by decomposing them into non-overlapping rectangles, in this case 4×3 and 10×6 . There is a strategic understanding of the problem given by the recomposing of the 4×3 rectangle into a 6×2 rectangle so that it will share a congruent side length with the 10×6 rectangle.



- 5 Mrs. Diaz's neighbors would like Tilly to tile their kitchens. There are 4 kitchen floors to tile and each kitchen will use 90 tiles.

How many total tiles will Tilly need for the 4 kitchen floors? 350 tiles

Show your work.

$$\begin{array}{r} 90 \\ 90 \\ 90 \\ + 90 \\ \hline 350 \end{array}$$

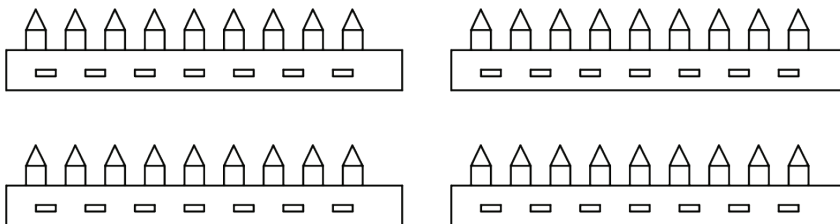
T5

The response shows a correct process for finding the number of tiles. The response shows understanding of multiplying a one-digit number by a multiple of 10, using strategies based on place value and properties of operations, understanding that multiplication is repeated addition, and adding 90 four times. A computational error when adding leads to an incorrect answer.

- 6 Tilly was asked to work on another project where a new neighborhood is being built. In the first plan, there were going to be 6 houses on each street and 6 streets total. The plans have changed and now there are 4 streets, but there is still the same total number of houses being built in the new neighborhood.

How many houses are now on each street? 9 houses

Show your work.



T6

The response shows a correct process for solving a word problem involving equal groups using multiplication and division. The response demonstrates the strategic use of a drawing to model the situation. It can be inferred that 6 was multiplied by 6 to find the total of 36 houses, and these were distributed among the 4 streets to show $36 \div 9$.



- 7 For another job Tilly will need 80 special tiles. She makes 6 special tiles each week.

After 8 weeks of making special tiles, how many more tiles does Tilly still need to make to have 80 special tiles? 32 more tiles

Use estimation to show why your answer is reasonable.

$$80 - (6 \times 8) =$$

$$80 - 48 = 32$$

I know that my answer is right because $48 + 32 = 80$.

T7

The response shows understanding of solving two-step word problems using the four operations, representing the problem with equations. The response shows an understanding of assessing the correctness of the answer 32. There may be a misconception with regard to the meaning of estimation and what is meant by a reasonable answer, since the answer of 32 is shown to be correct.

Sample D - Anchor Paper Commentary

Subject/Course: Math

Task Title: Tilly's Tiles

Grade Level: 3

Year: 2015-2016

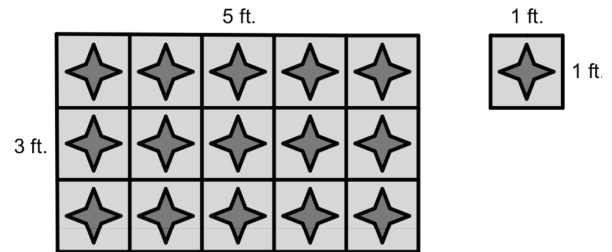
Rubric Traits	Anchor Score	Commentary/Rationale	Maximum Score
T1 Trait 1	0	An incorrect answer is given, stating that all of the rooms are the same size. An incorrect process, adding, for finding the area of each rectangle is shown.	2
T2 Trait 2	0	An incorrect answer of 2 ft. \times 10 ft. and 2 ft. \times 10 ft. is given. Although the process shown indicates that 40 tiles are used altogether, each room is 2 feet long.	2
T3 Trait 3	0	An incorrect answer of 576 is given, and an incorrect process is shown, given by $72 \times 8 = 576$.	2
T4 Trait 4	2	A correct answer of 72 tiles is given, and a correct process is shown, decomposing the area of the 4×3 rectangle to form a 6×2 rectangle that is used to compose a 12×6 rectangle.	2
T5 Trait 5	1	An incorrect answer of 350 tiles is given. A correct process is shown, with a computational error given by $90 + 90 + 90 + 90 = 350$, which leads to an incorrect answer.	2
T6 Trait 6	2	A correct answer of 9 houses is given. A correct process is shown, using a drawing to show 36 houses divided into 4 streets.	2
T7 Trait 7	1	A correct answer of 32 more tiles is given. A correct process for finding the number of tiles needed is given by $80 - (6 \times 8)$ and $80 - 48 = 32$. Estimation is not used to determine the reasonableness of the answer and is instead checked for correctness.	2

Score = 6/14, Level 2: Approaching Standards

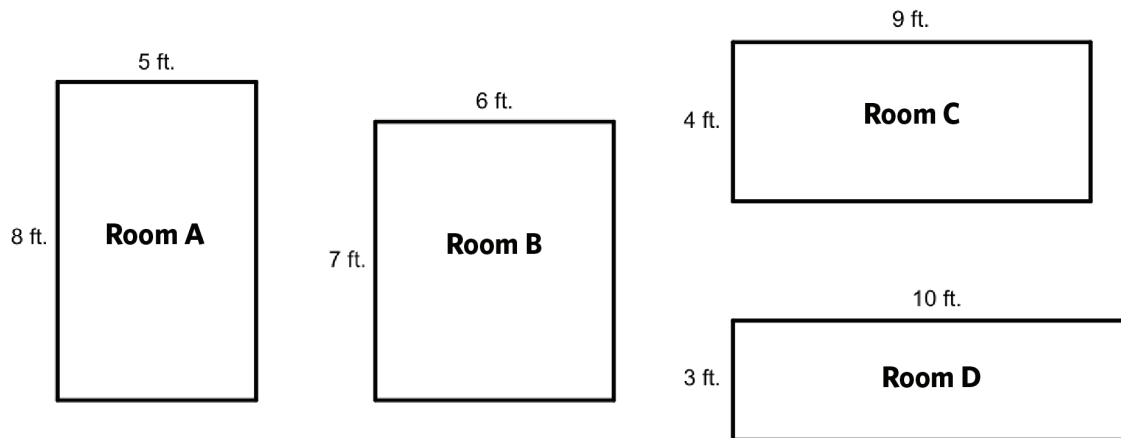


Tilly's Tiles

Tilly uses tiles that are 1 square foot to cover floors. Tilly is working on Mrs. Diaz's house tiling floors in many of the rooms. For example, the floor to the right is 5 feet long and 3 feet wide and is made of 15 tiles. Tilly needs to decide how many tiles she will need for each floor.



1 In Mrs. Diaz's house there will be 4 rooms for Tilly to tile:



Which room has the largest area? B because 42 is the greatest number

Show your work.

$$A = 5 \times 8 = 40$$

$$B = 6 \times 7 = 42$$

$$C = 4 \times 9 = 36$$

$$D = 10 \times 3 = 30$$

T1

The response shows an understanding of finding the area of rectangles in the context of real-world problems by multiplying side lengths. The response also shows understanding of ordering numbers, stating that 42 is the largest number.



- 2 Tilly will also tile the two bathroom floors in Mrs. Diaz's house. Both bathroom floors are rectangular floors that are each 4 feet wide.

Tilly uses a total of 40 tiles to cover both bathroom floors. What could be the lengths and widths of each floor if Tilly uses a total of exactly 40 tiles?

Measurements of Floor 1 - Length: 4 feet Width: 10 feet

Measurements of Floor 2 - Length: 4 feet Width: 10 feet

Show your work.

$$4 \times 10 = 40$$

T2

The response shows an incorrect process for finding the area of both floors using division to solve an unknown-factor problem. The response shows a misconception regarding the total number of tiles and instead shows that this may have been interpreted to mean that there are two floors to be tiled with 40 tiles each, and so the missing side will be 10 tiles. It is clear from the response that width and length are used interchangeably, since 4 feet is given as the length and not the width.

- 3 Tilly uses 72 tiles for Mrs. Diaz's outdoor patio. There are 8 tiles in each row of the patio.

How many rows are there? 8 rows

Write and solve a multiplication sentence to model the problem.

$$8 \times ? = 72$$

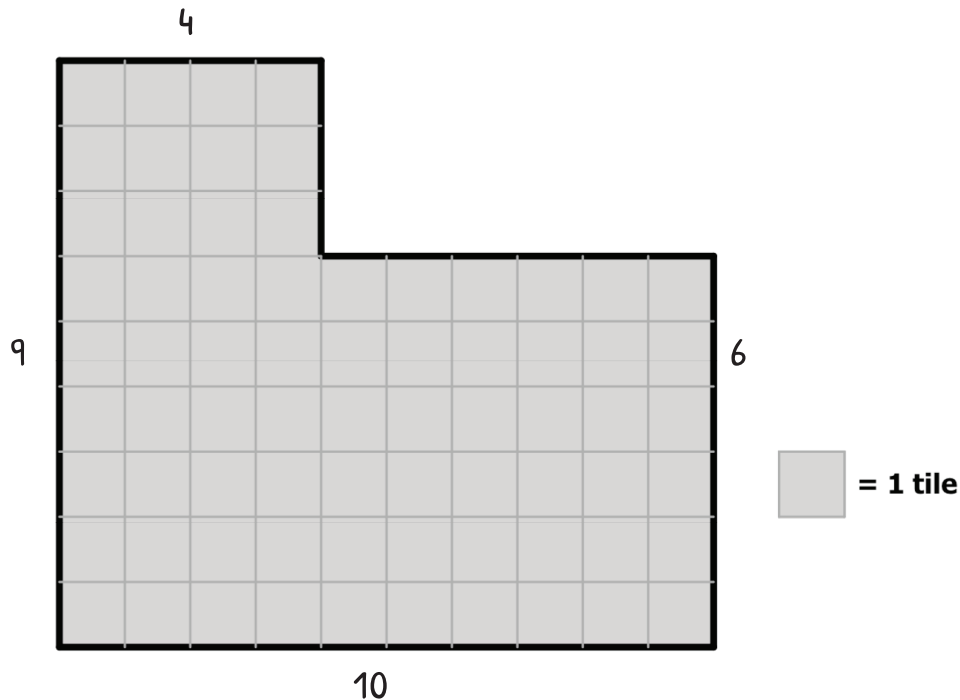
$$8 \times 8 = 72$$

T3

The response shows a correct process for interpreting division as an unknown-factor problem. A computational error leads to an incorrect answer of 8 rows.



- 4 Mrs. Diaz's kitchen is not a rectangle. Tilly needs to cover the floor shown below with tiles.



How many tiles will Tilly need to make the kitchen floor? 96 tiles

Show your work using number sentences.

$$9 \times 4 = 36$$

$$6 \times 10 = 60$$

$$36 + 60 = 96$$

T4

The response shows some understanding that area is additive by finding the area of rectilinear figures by decomposing them into rectangles. A misconception is shown regarding rectangles which are overlapping; thus 24 squares are counted twice.



- 5 Mrs. Diaz’s neighbors would like Tilly to tile their kitchens. There are 4 kitchen floors to tile and each kitchen will use 90 tiles.**

How many total tiles will Tilly need for the 4 kitchen floors? 180 **tiles**

Show your work.

$$90 + 90 = 180$$

T5

The response shows some understanding of multiplying a one-digit number by a multiple of 10, as a process of repeated addition is started. However, 90 is added twice rather than 4 times. It may be that this is based on a misconception about multiplication or a misinterpretation of the problem situation.

- 6 Tilly was asked to work on another project where a new neighborhood is being built. In the first plan, there were going to be 6 houses on each street and 6 streets total. The plans have changed and now there are 4 streets, but there is still the same total number of houses being built in the new neighborhood.**

How many houses are now on each street? 24 **houses**

Show your work.

$$6 \times 4 = 24$$

T6

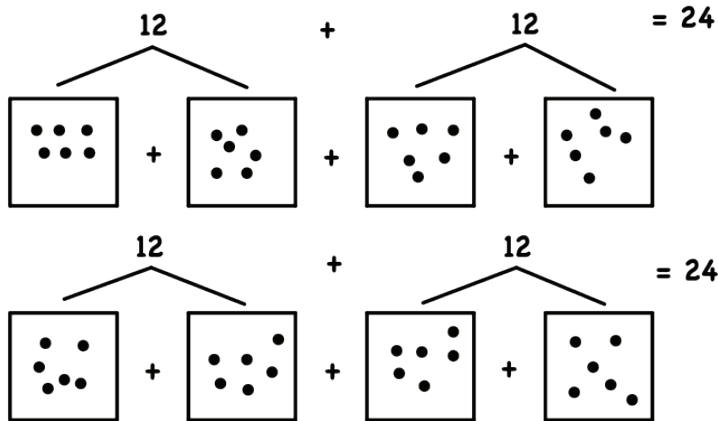
The response shows an incorrect process to solve a word problem in situations involving equal groups, using multiplication and division to find the number of houses in the neighborhood. There may be a misconception regarding the fact that the total number of houses remains 36 and that the number of streets and houses per street will change.



- 7 For another job Tilly will need 80 special tiles. She makes 6 special tiles each week.

After 8 weeks of making special tiles, how many more tiles does Tilly still need to make to have 80 special tiles? 48 more tiles

Use estimation to show why your answer is reasonable.



T7

The response shows some understanding of solving two-step word problems using the four operations, representing the problem with a drawing to model $6 \times 8 = 48$. There may be a misconception regarding the context of the trait. The response also does not show understanding of assessing the reasonableness of the answer, as estimation is not used.

$$\begin{array}{r} 24 \\ + 24 \\ \hline 48 \end{array}$$

Sample E - Anchor Paper Commentary

Subject/Course: Math

Task Title: Tilly's Tiles

Grade Level: 3

Year: 2015-2016

Rubric Traits	Anchor Score	Commentary/Rationale	Maximum Score
T1 Trait 1	2	The correct answer of Room B is given, and a correct process is shown, finding the area of each room by multiplying the side lengths.	2
T2 Trait 2	0	An incorrect answer of 4 ft. \times 10 ft. and 4 ft. \times 10 ft. is given. An incorrect process for finding the lengths of Floor 1 and Floor 2 is given by $4 \times 10 = 40$.	2
T3 Trait 3	1	An incorrect answer of 8 rows is given. A correct process is started, given by $8 \times ? = 72$, but a computational error, $8 \times 8 = 72$, leads to the incorrect answer.	2
T4 Trait 4	0	An incorrect answer of 96 tiles is given. An incorrect process is shown, decomposing the area into overlapping rectangles given by $9 \times 4 = 36$ and $6 \times 10 = 60$, which lead to $36 + 60 = 96$.	2
T5 Trait 5	0	An incorrect answer of 180 tiles is given. There is not enough evidence to show that a correct process was started.	2
T6 Trait 6	0	An incorrect answer of 24 houses is given. An incorrect process is shown, given by $6 \times 4 = 24$.	2
T7 Trait 7	0	An incorrect answer of 48 is given, and estimation is not used to show the reasonableness of the answer.	2

Score = 3/14, Level 1: Attempting Standards

Trait to Standard Alignment Chart

		Common Core Standards											
Trait	Question	K	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8	Algebra 1	Algebra 2	Geometry
1	1	K.CC.1	1.NBT.1	2.NBT.4	3.MD.7b	4.OA.2	3.NF.1	6.RP.1	7.EE.3	8.F.4	F.IF.4	G.SRT.8	G.CO.9
2	2	K.CC.2	2.NBT.2	2.NBT.4	3.OA.6	4.MD.3	5.NF.1	6.RP.3a	7.EE.1	8.F.4	F.IF.6	G.SRT.8	G.CO.10
3	3	1.NBT.1	1.NBT.5	2.NBT.7	4.NBT.6	4.OA.4	5.NF.1	6.EE.9	7.RP.3	8.F.4	F.BF.1a,b and F.BF.2	G.SRT.8	G.SRT.4
4	4	K.CC.1	2.NBT.8	2.NBT.4	3MD.7b	4.NBT.5	5.NF.4a	6.RP.3c	7.EE.2	8.EE.8b	4.OA.5	G.SRT.8	G.SRT.5
5	5	1.NBT.5	1.NBT.1	2.NBT.1	3.NBT.3	4.OA.5	5.NF.2	6.RP.3b	7.EE.2	8.EE.8a	F.BF.1a,b and F.BF.2	F.BF.1a	G.SRT.5
6	6	K.CC.3	2.NBT.3	2.NBT.1	3.OA.3	4.MD.2	5.NF.3	6.RP.2	7.RP.3	8.F.2	F.IF.5	F.TF.8	G.CO.5
7	7	1.NBT.1	1.NBT.3		3.OA.8	4.OA.3	5.NF.7b	6.RP.3	7.EE.4b	8.F.4	A.REI.7		G.SRT.5
8	8	K.CC.4	2.NBT.4				5.NF.7a				A.SSE.3a		
9	9	K.CC.6	1.OA.7										
10	10	1.NBT.3	2.OA.2										
11	11	K.OA.1	1.OA.1										
12	12	1.OA.7	2.OA.1										
13	13	K.OA.2											
14	14	1.OA.1											